

Serial No.: 10/671,940
Docket No.: 101-1007
Amendment after Final Rejection dated June 19, 2008
Reply to the Final Office Action of April 22, 2008

Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A printer comprising:
an ink head comprising a nozzle unit to eject ink drops in a shingling mode providing edge printing;
an ink collector positioned under paper to correspond to the nozzle unit and having first and second wall portions to enclose a space to collect ink therebetween; and
first and second support beams connected to and extending away from inner portions of a respective one of the first and second wall portions of the ink collector in a direction towards the other one of the first and second wall portions of the ink collector, which face each other in the paper feed direction and in an opposite direction to the paper feed direction, respectively, and the first and second support beams being alternately arranged with each other in a scan direction, such that a portion of each of the first support beams which are parallel to the inner portions of the first and second wall portions do not face a portion of each of the second support beams which are parallel to the inner portions of the first and second wall portions.
2. (Previously Presented) The printer of claim 1, wherein the first and second support beams are extended in the paper feeding direction by first and second lengths, respectively, the first length comprises a first paper contact portion and a first paper non-contact portion shorter than the first paper contact portion, and the second length comprises a second paper contact portion and a second paper non-contact portion shorter than the second paper contact portion.
3. (Previously Presented) The printer of claim 1, wherein the first and second support beams extend to have the same length to support the paper.
4. (Original) The printer of claim 3, wherein an end point of the first support beam and an end point of the second support beam face each other in the scan direction.

5. (Previously Presented) The printer of claim 3, wherein the end point of the first support beam extends in the paper feed direction to interlace with that of the second support beam.

6. (Previously Presented) The printer of claim 4, wherein the first and second support beams have the same height in a direction toward the ink head, the direction perpendicular to the paper feed direction and the scan direction.

7. (Original) The printer of claim 5, wherein the first and second support beams have the same height in a direction toward the ink head, the direction perpendicular to the paper feed direction and the scan direction.

8. (Previously Presented) The printer of claim 7, wherein the first and second support beams extend from barriers, which partition the ink collector.

9. (Previously Presented) The printer of claim 7, wherein the first and second support beams are ribs segmenting a space of the ink collector without partitioning it.

10. (Previously Presented) The printer of claim 1, wherein the second support beam has a round end portion.

11. (Previously Presented) The printer of claim 1, wherein the second support beam has a slant end portion inclining in the paper feed direction.

12. (Withdrawn) A shingling method to provide edge printing, comprising:
feeding paper such that an edge portion of the paper is located under a nozzle unit of an ink head and printing first data on the edge portion of the paper positioned between support beams supporting the paper, the first data being generated by masking data corresponding to positions of the support beams; and
moving the paper in a paper feed direction by a predetermined width and printing second

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data on the edge portion of the paper positioned between support beams.

13. (Withdrawn) The shingling method of claim 12, wherein the first data and the second data are in a complementary relationship.

14. (Withdrawn) The shingling method of claim 12, wherein in the paper feeding operation, masking is performed using a first mask in which a number of consecutive 0% printing columns, which are alternately distributed with a number of 100% printing columns, gradually changes in inverse proportion to the number of consecutive 100% printing columns in a scan direction perpendicular to the paper feed direction.

15. (Withdrawn) The shingling method of claim 14, wherein in the paper moving operation, the second data is generated by performing masking using a second mask, which is in a complementary relationship with the first mask.

16. (Withdrawn) The shingling method of claim 12, wherein in the paper feeding operation, the support beams extend from a paper feed side in the paper feed direction.

17. (Withdrawn) The shingling method of claim 16, wherein in the paper moving operation, the support beams extend from a paper discharge side in an opposite direction to the paper feed direction and interlace with the support beams extending from the paper feed side.

18. (Withdrawn) The shingling method of claim 16, wherein the support beams are part of an ink collector collecting ink digressing from the paper.

19. (Withdrawn) The shingling method of claim 17, wherein the support beams are part of an ink collector collecting ink digressing from the paper.

20. (Withdrawn) The shingling method of claim 12, wherein in the paper feeding operation, the paper is fed by 1/2 of a width of the nozzle unit in the paper feed direction.

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21. (Withdrawn) The shingling method of claim 20, wherein in the paper moving operation, the paper is fed by 1/2 of the width of the nozzle unit in the paper feed direction.

22. (Withdrawn) The shingling method of claim 12, wherein in the paper moving operation, the second data is applied to a nozzle section positioned above the edge portion of the paper, and the other nozzle section operates in a shingling mode providing normal printing.

23. (Withdrawn) The shingling method of claim 12, further comprising moving the paper in the paper feed direction after completing front edge printing in the paper moving operation and performing printing in a normal shingling mode.

24. (Withdrawn) The shingling method of claim 12, further comprising performing printing in a normal shingling mode before the paper feeding operation, wherein printing is performed in a shingling mode providing rear edge printing in the paper feeding operation.

25. (Previously Presented) A printer comprising:
an ink head ejecting ink drops at an edge of a printing medium;
an ink collector having a first upright wall portion at a printing medium feed side of the ink collector and a second upright wall portion at a printing medium discharge side of the ink collector spaced-apart from each other and extending in a direction perpendicular to the printing medium to define a space to collect ink from the printing medium;
a plurality of first support beams extending away from the first upright wall portion over the space at an upper portion of the ink collector in a printing medium feed direction to support the printing medium at the printing medium feed side of the ink collector; and
a plurality of second support beams extending away from the second upright wall portion over the space at an upper portion of the ink collector in an opposite direction to the printing medium feed direction and alternately arranged with the plurality of first support beams to support the printing medium at the printing medium discharge side of the ink collector.

26. (Original) The printer of claim 25, wherein the ink head comprises an ink nozzle to eject ink drops on the printing medium when the ink head moves in a scan direction.

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27. (Previously Presented) The printer of claim 26, wherein the ink collector is located under the printing medium and has a width corresponding to the width of the ink head.

28. (Previously Presented) The printer of claim 26, wherein the ink collector is located under the printing medium and has a width wider than the width of the ink head.

29. (Previously Presented) The printer of claim 27, wherein the ink collector further comprises:
a floor portion, and the space portion has an opening above the floor portion to catch the ink drops.

30. (Original) The printer of claim 29, wherein the space portion comprises a felt to absorb the ink drops caught by the space portion.

31. (Original) The printer of claim 25, wherein the ink collector comprises:
a plurality of space portions; and
a plurality of barriers separating the plurality of space portions,
wherein the first and second support beams integrally extend from the barriers alternately with respect to each other.

32. (Previously Presented) A printer comprising:
an ink head ejecting ink drops at an edge of a printing medium;
a platen along which the printing medium is conveyed;
an ink collector including a space portion positioned beneath an upper surface of the platen to collect excess ink from the printing medium;
a plurality of first support beams disposed within the space portion at a printing medium feed side of the ink collector extending in a printing medium feed direction away from a first upright wall to support the printing medium above the space portion; and
a plurality of second support beams disposed within the space portion at a printing medium discharge side of the ink collector and extending in an opposite direction to the printing

medium feed direction away from a second upright wall, the plurality of second support beams being overlapped by the plurality of first support beams to support the printing medium during feeding thereof between the ink head and the ink collector.

33. (Withdrawn) A shingling method to provide edge printing, comprising:
feeding a printing medium passed ink nozzles of an ink head;
printing first data on a front edge portion of the printing medium at positions between a set of support beams supporting the printing medium; and
moving the printing medium in a feed direction by a predetermined distance and printing second data on the front edge portion of the printing medium at positions complimentary to the first data such that the complete edge of the printing medium receives printing data.

34. (Withdrawn) The shingling method of claim 33, wherein in the printing medium feeding operation, the first data is generated by performing masking using a first mask.

35. (Withdrawn) The shingling method of claim 34, wherein in the printing medium moving operation, the second data is generated by performing masking using a second mask, which is in a complementary relationship with the first mask.

36. (Withdrawn) The shingling method of claim 35, wherein masking is performed using a first mask in which a number of consecutive 0% printing columns, which are alternately distributed with a number of 100% printing columns, gradually changes in inverse proportion to the number of consecutive 100% printing columns in a scan direction perpendicular to the printing medium feeding direction.

37. (Withdrawn) The shingling method of claim 33, further comprising:
moving the printing medium in the feeding direction after completing front edge printing and performing normal shingling printing;
printing the first data on a rear edge portion of the printing medium at positions between a set of support beams supporting the printing medium; and
moving the printing medium in a feed direction by a predetermined distance and printing

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the second data on the rear edge portion of the printing medium at positions complimentary to the first data such that the complete edge of the printing medium receives printing data.

38. (Withdrawn) The shingling method of claim 37, wherein in the printing medium feeding operation, the first data is generated by performing masking using a first mask and the second data is generated by performing masking using a second mask, which is in a complementary relationship with the first mask.

39. (Withdrawn) The shingling method of claim 38, wherein masking is performed using a first mask in which a number of consecutive 0% printing columns, which are alternately distributed with a number of 100% printing columns, gradually changes in inverse proportion to the number of consecutive 100% printing columns in a scan direction perpendicular to the printing medium feeding direction.

40. (Previously Presented) A printer comprising:
an ink head having a nozzle unit to eject ink drops;
an ink collector positioned under paper to correspond to the nozzle unit and having first and second opposing and upright wall portions to enclose a defined space to collect ink;
one or more first support beams extending away from the first opposing wall portion of the ink collector and toward the second opposing wall portion in a paper-feed direction partially across the defined space; and
one or more second support beams connected to and extending away from the second opposing wall portion of the ink collector and toward the first opposing wall portion in an opposite direction to the paper feed direction partially across the defined space.

41. (Currently Amended) A printer comprising:
an ink head having a nozzle unit to eject ink drops;
an ink collector positioned under paper to correspond to the nozzle unit and having first and second opposing and upright wall portions to enclose a defined space to collect ink; and
first support beams and second support beams connected to and extending away from respective ones of the first and second opposing wall portions of the ink collector in a direction

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towards the other one of the first and second opposing wall portions of the ink collector and in a
paper-feed direction and an opposite direction to the paper feed direction, respectively, to
segment the defined space of the ink collector without partitioning the defined space.

42. (Previously Presented) The printer of claim 41, wherein the paper is
supported by the first support beams without contacting the second support beams at a first
time, and the paper is supported by the second support beams without contacting the first
support beams at a second time following the first time.